16. Use of mapped SSR markers to assist the selection of low-gossypol seeds and high-gossypol plant cultivars in upland cotton

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Mapped SSR markers were used to assist the phenotypic selection of genotypes expressing the low-gossypol seed and high-gossypol plant trait in BC1, BC2, BC2S1, BC2S2, BC2S3, BC2S4, BC2S5, BC2S2, BC1-S1, BC3, BC3S1, BC3S2, BC3S3, BC2S2BC1 and BC2S2BC1S1 genotypes obtained from the G. hirsutum L. x G. raimondii Ulb. x G. sturtianum (HRS) trispecific hybrid. Two hundred and six mapped microsatellite markers uniformly distributed on the 26 linkage groups of the *G. hirsutum* genetic map were used to monitor the introgression of *G. sturtianum* Willis and *G. raimondii* Ulb. chromosomal segments in the progenies of the HRS hybrid. Out of 146 polymorphic SSRs amplified on the analysed materials, 188 alleles were introgressed from the wild donor species *G. sturtianum* into the HRS hybrid. A total of 14 *G. sturtianum* alleles mapped on c2-c14, c3-c17, c6-c25, c12-c26 and A03-D02 homeologous chromosome pairs were conserved on the selected BC2S4 and BC2S5 genotypes while the *G. sturtianum* or *G. raimondii* origin of a locus on c12 could not be determined. For the selected BC3S3 materials, three alleles were conserved on c6-c25 chromosomes. The two selected BC2S2, BC1S1 genotypes conserved respectively 13 and 11 alleles of *G. sturtianum* on c2-c14, c3-c17 and c6-c25 homeologous chromosomes pairs. All selected plants in this work presented a normal density of gossypol glands on their aerial parts and produced regularly an important proportion of almost totally glandless seeds. These plants constitute valuable genetic stocks for the introgression of interesting agronomic traits from the wild parental species of HRS into *G. hirsutum*.

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